

NON-PUBLIC?: N  
ACCESSION #: 9008280383  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Grand Gulf Nuclear Station PAGE: 1 OF 3

DOCKET NUMBER: 05000416

TITLE: Reactor Scram on High Reactor Water Level  
EVENT DATE: 07/24/90 LER #: 90-011-00 REPORT DATE: 08/23/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Jewel Summers/Compliance Coordinator TELEPHONE: (601) 437-2149

COMPONENT FAILURE DESCRIPTION:  
CAUSE: X SYSTEM: JK COMPONENT: SCO MANUFACTURER: D006  
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

#### ABSTRACT:

On July 24, 1990 at 1355, the reactor tripped on high reactor water level. Reactor power was in the process of being reduced in an attempt to control "B" Reactor Feed Pump Turbine (RFPT) oscillations caused by a malfunction of the "B" RFPT Controller.

The cause of the malfunctioning "B" RFPT Controller was determined to be an intermittent failure of the Linear Variable Differential Transformer (LVDT) and the associated circuit board to the Electronic Automatic Positioner (EAP).

The EAP Dahl Controller was calibrated in accordance with the vendor recommended setting. The calibration procedure for the Reactor Feed Pump Turbine "A" and "B" FAP Dahl control circuit has been improved and the calibration frequency has been increased.

All plant safety systems performed as expected. The minimum water level

reached was approximately 126.7 inches above the top of active fuel. The RCIC was manually started and functioned as designed.

LER90011/SCMPFLR

#### A. REPORTABLE OCCURRENCE

On July 24, 1990 at 1355, the reactor tripped on high reactor water level. This Reactor Protection System (RPS) actuation is reported pursuant to 10CFR50.73(a)(2)(iv).

#### B. INITIAL CONDITIONS

The plant was operating at approximately 100 percent reactor power at the time of the occurrence.

#### C. DESCRIPTION OF OCCURRENCE

On July 24, 1990 at 1348, the plant was operating at approximately 100 percent reactor power. A malfunction of the "B" Reactor Feed Pump Turbine Controller (EIIS System Code: SK) caused the "B" Reactor Feed Pump Turbine speed to fluctuate without operator action. This condition resulted in feedwater flow problems and reactor water level oscillations.

In an attempt to control the "B" Reactor Feed Pump Turbine (RFPT) oscillations, operators placed the Feedwater Master Controller and both RFPTs in manual, but reactor water level continued to decrease. The Reactor Core Isolation Cooling (RCIC) System (EIIS System Code: BN) was manually initiated. Reactor water level continued to decrease until a half scram was received on low reactor water level. Reactor water level began to increase to near normal level of 36 inches following the RCIC initiation and the half scram was reset. Operations initiated a power reduction.

At 1355, with reactor power fluctuating around 75 percent, coupled with "B" feed pump oscillations, reactor water level reached the high reactor water Level 8 scram setpoint. A reactor scram was received on Reactor High Water Level (+53.5"). Immediate operators actions were taken in accordance with the Scram Off-Normal Event Procedure. The recirculation pumps shifted to slow speed due to low reactor water level caused by the scram. Operators then entered the

appropriate Emergency Procedures (EPs) and manually tripped the Main Turbine. The "B" RFPT was manually tripped due to its malfunctioning controller. The RCIC System was secured after

reactor water level reached 40.7 inches and increasing. Control Rod Drive (CRD) (EHS System Code: CD) flow was maximized by starting the CRD "B" pump. Water level control was reestablished, the scram was reset, and the EPs were exited. Conditions were restored to normal at 1521.

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#### D. APPARENT CAUSE

An immediate investigation was conducted to determine the cause of the Reactor Feed Pump Turbine "B" malfunction which caused major oscillations in speed and discharge flow resulting in the Level 8 scram.

Initial trouble-shooting was performed on the feed pump control circuit and the Dahl controller was found to be out of calibration. The controller was observed to have a dead-band of approximately 6% which was outside of the vendor recommended setting of 1 percentage point of span. The Dahl controller was re-spanned and a special test instruction was written to run the feed pump at a reactor pressure of approximately 500 psig. Following the 500 psig test, additional tuning was completed on the Dahl controller. The test was re-run and the results were satisfactory. At approximately 25% reactor power, the feed pump was again tested using a special test instruction. Additional tuning was completed.

Oscillations were observed during RFPT "B" startup at 50% power. An evaluation of the data indicated that the most probable cause was an electronic component failure in the Dahl controller's LVDT feedback circuit. The LVDT and EAP circuit board were replaced.

#### E. SUPPLEMENTAL CORRECTIVE ACTIONS

The calibration procedure for the RFPT "A" and "B" EAP Dahl control circuit has been improved and the calibration frequency has been increased. Due to the limited availability of spare parts for the Dahl controller, and an ongoing effort to increase Feedwater System reliability, future design changes are being evaluated.

#### F. SAFETY ASSESSMENT

The Post Trip Analysis confirmed that all safety systems performed as expected during the transient. The reactor tripped as designed on level 8. The minimum water level reached was -40 inches as indicated on the wide range level instrumentation which is

approximately 126.7 inches above the top of active fuel. The RCIC was manually started and functioned as designed

ATTACHMENT 1 TO 9008280383 PAGE 1 OF 1

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W. T. Cottle  
Vice President  
Nuclear Operations

August 23, 1990

U.S. Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, D.C. 20555

Attention: Document Control Desk

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station  
Unit 1 Docket No. 50-416  
License No. NPF-29  
Reactor Scram on High Water  
Level  
LER 90-011-00  
AECM-90/0159

Attached is Licensee Event Report (LER) 90-011-00 which is final report.

Yours truly,

WTC:  
Attachment

cc: Mr. D. C. Hintz (w/a)  
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